

Selection & Specification Data

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| Generic Type | Cross-linked epoxy polymeric amine |
| Description | This is a high abrasion-resistant all-purpose epoxy that has a variety of attributes including low-temperature cure, surface tolerance, fast recoat times, moisture tolerance during application and cure, and excellent corrosion protection. Carboguard 635 HAR can be used direct to metal as a corrosion resistant primer or as an intermediate coating over other primers. It is suitable for both maintenance and new construction projects due to its excellent surface wetting characteristics and quick cure for handling. It may also be used for immersion in fresh or salt water exposures, and exhibits exceptional abrasion resistance and toughness. |
| Features | <ul style="list-style-type: none"> • Low temperature cure (-7°C) • Excellent corrosion protection • Excellent application characteristics • Fast recoat times • Moisture tolerance during application • Extended recoat window for atmospheric exposures (6 months for most topcoats) |
| Gloss | Satin |
| Colour | Red Oxide, N35 Light Grey |
| Primers | Self priming |
| Topcoats | Acrylics, Alkyds, Epoxies, Polyurethanes, Polysiloxanes |
| Dry Film Thickness | For most applications: 100-150 microns per coat. Note: <i>Thicknesses above this range may result in higher gloss appearance which can interfere with topcoat adhesion. Follow "Curing Schedule" notes to mitigate possible adhesion issues.</i> |
| Solids Content | Theoretical solids (mixed) by volume: SBV: 65 +/- 2% |
| Theoretical Coverage Rate | 25 m ² /l at 25 microns, 6.4 sq. m/l @ 100 microns NOTE: Material losses during mixing and applications will vary and must be taken into consideration when estimating job requirements. |
| Mix Ratio | 4 : 1 by volume (Part A : Part B) |
| VOC Values | As supplied: 296 g/l mixed |
| Dry Temp. Resistance | Continuous: 82°C Non-Continuous: 104°C |
| Abrasion Resistance | 55-65 mg loss (Tabor Abrader Test using 1 kg weight, CS17 wheel, and 1000 cycles) |
| Elongation (Flexibility) | ASTM D 522, Method B Passes 180° Bend, 5mm (0.197") Mandrel |
| Adhesion | ASTM D4541 / ISO 4624 – Positest AT Hydraulic > 1700 psi on SP10 steel, 30 – 40 µm profile |
| Limitations | Epoxies lose gloss, discolor and eventually chalk in sunlight exposure. |

Substrates & Surface Preparation

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| General | Remove any oil or grease from surface to be coated with clean rags soaked in Carboline Thinner #2, or toluol. Concrete Do not apply coating unless concrete has cured at least 28 days @ 21°C and 50% RH or equivalent. |
| Steel | For optimal performance: Hand Tool or Power Tool clean in accordance with AS1627.2 St2 or St3 (SSPC-SP 2, SSPC-SP 3) to produce a rust-scale free surface. For maximum performance: AS1627.4 Class 2 or SSPC-SP 6 (or better) with a 40-75 micron coarse blast profile. |

Application Equipment

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results. **General Guidelines:**

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| Spray Application (General) | Hold gun 12-14 inches from the surface and at a right angle to the surface. |
| Conventional Spray | Pressure pot equipped with dual regulators, 9mm (3/8") I.D. minimum material hose, 1.8mm (.070") I.D. fluid tip and appropriate air cap. |
| Airless Spray | Pump Ratio: 30:1 (min.) Volume Output: 9.5 l/min min. Material Hose: 9 mm I.D. min. (3/8") Tip Size: 0.43-0.53mm (0.017-0.021") Output Pressure: 140-175kg/cm ² (2000-2500 psi) Use a 9mm (3/8") minimum I.D. material hose |
| | The following spray equipment from Graco, or equivalent has been found to be suitable. Gun - Graco 207-300 Pump* – Bulldog 45:1 |
| | *Teflon packings are recommended and available from pump manufacturer. |
| Brush & Roller (General) | For applications over damp surfaces, brush and roller is the preferred method. Multiple coats may be required to obtain desired appearance, recommended dry film thickness, and adequate hiding. Avoid excessive re-brushing or re-rolling. For best results, tie-in within 10 minutes 24°C. Use a short-nap synthetic roller cover with phenolic core. |

Carboguard® 635 HAR

Mixing & Thinning

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| Mixing | Mix separately, then combine and mix in the following proportions (4:1 ratio): |
| Ratio | 5 litre kit – 4 litre Comp A, 1 litre Comp B |
| Thinning | For atmospheric applications thin up to 8% by volume with Carboline Thinner #76. or 8% by volume per with Thinner #33 for brush and roller. For immersion use Thinner #38E up to 8%. |
| Pot Life | 3 hours at 24°C and less at higher temperatures. Pot life ends when coating becomes too viscous to use. |

Cleanup & Safety

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| Cleanup | Use Thinner #2 or Acetone. In case of spillage, absorb and dispose of in accordance with local applicable regulations. |
| Safety | Read and follow all caution statements on this product data sheet and on the MSDS for this product. Employ normal workmanlike safety precautions. Hypersensitive persons should wear protective clothing, gloves and use protective cream on face, hands and all exposed areas. |
| Ventilation | When used as a tank lining or in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, OSH approved supplied air respirator. |
| Caution | This product contains flammable solvents. Keep away from sparks and open flames. All electrical equipment and installations should be made and grounded in accordance with the local electrical code. In areas where explosion hazards exist, workmen should be required to use non-ferrous tools and wear conductive and non-sparking shoes. |

Application Conditions

| Condition | Material | Surface | Ambient | Humidity |
|-----------|------------|------------|------------|----------|
| Optimum | 16° - 24°C | 16° - 24°C | 16° - 24°C | 30-70% |
| Minimum | 7°C | -7°C | -7°C | 0% |
| Maximum | 32°C | 50°C | 35°C | 95% |

Industry standards are for substrate temperatures to be above the dew point. Carboguard 635 HAR is unique in that it can tolerate damp substrates. See Brush or Roller above. Special thinning and application techniques may be required above or below normal conditions.

Curing Schedule

| Non-Immersion Schedule | | | |
|---------------------------------------|---------------|---------------------|---------------------|
| Surface Temp. & 50% Relative Humidity | Dry to Handle | Dry to Topcoat Min. | Dry to Topcoat Max. |
| -7°C | 36 hrs | 24 hrs | 180 days |
| 2°C | 16 hrs | 2 hrs | 180 days |
| 10°C | 10 hrs | 1 hr | 180 days |
| 24°C | 3 hrs | 45 min | 180 days |
| 32°C | 1.5 hrs | 30 min | 180 days |

Curing Schedule continued

| Immersion Schedule – 635 HAR or Antifouling | | | |
|---|----------------------|--|---|
| Surface Temp. & 50% Relative Humidity | Dry to Topcoat Min.t | Dry to Topcoat with Antifouling Maximum* | Dry to Topcoat with 635 HAR Maximum* |
| -7°C | 24 hrs | 36 hrs | Up to 30 days; high temps and/or sunlight exposure may shorten this recoat schedule |
| 2°C | 2 hrs | 16 hrs | |
| 10°C | 1 hr | 8 hrs | |
| 24°C | 45 min | 4 hrs | |
| 32°C | 30 min | 3 hrs | |

*These times are to be used as a guideline. The optimum time to topcoat with an antifoulant is when the 635 HAR is "touch-tacky". If the touch-tacky time has been exceeded, or if the film is "glossy", you can generally reprime/refresh the first coat of 635 HAR with a fresh coat of itself. The longer the first coat has to cure, particularly in sunlight exposure or elevated temps, the higher risk of inadequate adhesion. If those maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. Contact your local Carboline Marine Representative for assistance/guidance.

Marine Use: Undocking time of 24 hours @24°C

The listed times in the chart above are based on a 100-150 micron dry film thickness per coat. Deviation from those thicknesses may compromise the performance and adhesive properties of the film. Higher film thickness, insufficient ventilation or cooler temperatures could result in solvent entrapment and premature failure. Excessive humidity or condensation on the surface during curing will not affect performance but may cause discoloration and result in a surface haze. Any haze or blush must be removed by water washing before recoating. If the maximum recoat times have been exceeded, the surface must be abraded by sweep blasting or sanding prior to the application of additional coats. For force curing, contact Carboline Technical Service for specific requirements. For application and cure conditions below 2°C, dehumidify before, during, and after application to prevent ice formation on the surface.

*Do not apply to substrates with ice or ice crystal formation. Dehumidify or raise the temperature to eliminate ice on the substrate.

Packaging, Handling & Storage

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| Pack Sizes | Australia | 5 litre & 20 litre kits |
| | New Zealand | 5 litre kits |
| Flash Point (Setflash) | Part A: 7°C | Part B: 15°C |
| Storage Temperature & Humidity | Store Indoors. KEEP DRY 4°C-38°C 0-95% Relative Humidity | |
| Shelf Life | Part A: 24 months at 24°C Part B: 24 months at 24°C | |

*Shelf Life: (actual stated shelf life) when kept at recommended storage conditions and in original unopened containers.

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